

Common Storm Water Structures

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Streets

Storm water runoff is often channeled first as it leaves individual properties and flows down our city streets. Depending on how a development is designed, storm water will flow through a network of streets and ultimately discharge into a community retention basin, open channel, or river. Along the way the storm water collects trash, debris, sediment, grease and oil. The storm water is discharged **UNTREATED** into the community retention basin, open channel or rivers. Keeping streets clean by picking up trash, picking up after pets, sweeping - instead of washing - driveways and other paved areas, maintaining your yard by containerizing leaves and grass, and regularly using commercial and municipal street sweepers are actions we can take to keep pollutants from accumulating on our streets and entering the storm water system.



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Street Scuppers

Street scuppers are common structures installed along the curb of a street and are designed to carry water short distances to nearby retention basins, open channels or rivers. These structures are generally made of concrete and exist above ground. Contaminants such as trash, debris and sediment can block these structures leading to localized street flooding, so some regular maintenance is required. Even though street scuppers are often installed in the public right-of-way, these structures may be privately owned by individuals, developers, a home-owners association (HOA), business or corporation; and the responsibility for the maintenance of these structures may fall on them.



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Catch Basins

Storm water runoff flowing in the streets often drains into catch basins. Catch basins, also known as storm drain inlets and curb inlets, are commonly installed in the center of a street with a metal screen grate cover, or along the street curb or gutter. Some catch basins have a depressed area which allows solids to settle out which provides one of the first opportunities for removing debris and other pollutants from the storm water runoff. Water leaves a catch basin through subsurface piping and commonly discharges in a nearby retention basin, open channel or river.

In order for the catch basin to operate effectively, the accumulated debris and sediment must periodically be removed. Ill-maintained catch basins can cause street flooding and can provide a harbor for the breeding of mosquitoes and other nuisance insects. Even though catch basins are often installed in the public right-of-way, these structures may be privately owned by individuals, developers, an HOA, business or corporation; and the responsibility for the maintenance of these structures may fall on them.



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Storm Water Sewers & Headwalls

Headwalls are structures present at the point where subsurface storm water pipes discharge either into local retention basins or open channels/rivers. The subsurface storm water pipes connect the headwall location to up-gradient catch basins usually installed in parking areas, streets, or along the gutter or curb line.

Most of these structures have a grate installed to keep children and animals from entering the pipes. These structures require regular maintenance to keep the grate free of trash and debris. The maintenance of that portion of the storm water sewer that is outside of the public right-of-way is the responsibility of the property owner. Most headwall structures are not installed within the public right-of-way areas.



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Retention Basins

Retention basins are depressed surface structures that offer open space and may be used as community parks during dry weather conditions. Storm water runoff commonly enters retention basins from subsurface pipes, or directly from streets, street scuppers, or open channels. The storm water is temporarily stored in these basins until it drains (or percolates) into the underlying soils. The City of Surprise only owns a small percentage of these basins, with the majority being privately owned by individuals, developers, an HOA, business or corporation.



Retention basin owners are required to maintain these structures in order to keep them operating properly. Poorly maintained retention basins can provide a harbor for the breeding of mosquitoes and other nuisance insects. City of Surprise Municipal Code [Title 15, Chapter 20](#) makes it unlawful for an owner of a retention basin to permit water to stand longer than **thirty-six hours**. The City of Surprise retains the right to drain poorly functioning drainage basins if standing water exists beyond a period of thirty-six hours since the most recent precipitation event.

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Drywells

A drywell is a structure that penetrates subsurface soils and is used to aid in the drainage of storm water through percolation. These structures should not be installed to the depths of groundwater. The Arizona Department of Environmental Quality (ADEQ) registers and regulates dry wells under their [drywell program](#). All owners of drywells are required to have them registered with the ADEQ.



Regular maintenance is required for drywells in order to keep them operating properly. Standing water in a drywell provides a harbor for the breeding of mosquitoes and other nuisance insects. The City of Surprise Municipal Code [Title 15, Chapter 20](#) requires a maintenance program to be submitted for each dry well and documentation of maintenance performed on each dry well to be submitted to the city on an annual basis.

Most drywells are permanent structures installed in privately-owned retention basins. However, some may be installed within the public right-of-way or other areas to provide temporary infiltration until further drainage structures can be constructed.

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Open Channels and Rivers

Open channels can be natural washes, streams, and rivers, or engineered systems lined with grass, crushed rock, or constructed out of concrete. Often these systems, whether natural or engineered, drain large areas and become connected further down stream. Due to the large area rivers like the Agua Fria drain, the build up of pollutants can be substantial. Therefore, discharges to a water of the United States, such as the Agua Fria River and any of its tributaries, are regulated by the Environmental Protection Agency and the Arizona Department of Environmental Quality.



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Culverts

Culverts are structures that allow roads, driveways, and business entrances to cross over an open channel. They are generally rectangular in shape and made of concrete. In general, contaminants at culverts consist of trash, debris and sediment. Occasional maintenance is required to keep these systems operating properly.



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Subsurface Storage Structures

Storm water runoff from large development projects, such as a strip mall, is often stored underground beneath the large parking lots. These structures are generally very large in size, and are not as immediately apparent as surface retention basins. Because these structures drain areas where various vehicles are constantly parked, these structures require regular maintenance to retain oils and other pollutants before the storm water can be discharged to drywells and the subsurface soils. Sunlight will usually not reach these subsurface structures, so the proliferation of mosquitoes is less likely. However, other nuisance insects that prefer to live in damp, dark areas, such as cockroaches, and rodents may find these structures a harbor for breeding.



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